

Work Order ID 136798

September 09, 2015 12:54:06 PM

136798

Page 1

Order to ship Sept 25

Item ID: D5155-7

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Co-Pilot Collective Head (205)

Start Date: 9/9/2015

Start Qty: 1.00

1

Cust Item ID:

Required Date: 9/23/2015

Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: SJA

Date: 150909

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D5155

B

100

Cut blanks as per folio

0.00

100

Bandsaw

Memo

0.00

Jeaspa Bandsaw

CUT BLANK AT 5.000"

D.A. 15/09/21

2⁺

0

DAS
08
9-89

110

0.00

110

HAAS 5AXIS

Memo

0.00

HAAS CNC vertical machine #5

MACHINE AS PER DWG & FOLIO FB349/ D5155-7

FOLIO REV: RA

DWG REV: B

D.A. 15/09/21

2

1

DAS
08
9-89

DO NOT BUFF OR POLISH PART

DEBURR

DQA:

Date:

15/10/19



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed:

Date:

15/10/01

Work Order update only ☐

Work Order: <u>136798</u>		DISPOSITION		AGAINST DEPARTMENT/PROCESS			
Part No. <u>D5155-7</u>		Rework ☐		Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐
NCR No. <u>15-5369</u>		Scrap ☒		Machining ☒	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐
		Use-as-is ☐		Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐
		Suspected Unapproved ☐		Large Fab ☐	Composite ☐	Supplier ☐	
Date: <u>15/09/21</u>	Step #: <u>110</u>	QTY Effective: <u>1</u>		MRB (QS1042) Approval			
Description Work Order Deviation		Disposition		DAS 9 9-89 <u>15-09-23</u>			
> On the 1st part the 3/4 rougher pattern was corrupted. It wasn't raising high enough to safe distance. So at one point it gouged the spigot about .750" deep from top and about .030" into spigot ϕ.		Scrap n replace B#: <u>127464</u> Toolpath for roughing has been regenerated and re-posted <i>[Signature]</i>		Completed By DAS 08 15/09/21			
				Lead hand / Supervisor Approval Verification <u>15/09/23</u>			
				QC / QA Coordinator Approval DAS 9 9-89 <u>15-09-23</u>			
Root Cause		FAULT CATEGORY					
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐		
Design ☐	Operator ☐	Bending ☐	Set-up ☐	☒ Folio/Program	Outside Dimensions ☐		
Doc/Data ☒	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐		
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐		
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐		
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐		
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐		
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐		
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐		
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐		
Past Expiry Date ☐	Manufacturing Process ☐						
Misidentified ☐	Past Due ☐	OTHER: ☐					

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____							
Misidentified ☐	Past Due ☐								

Work Order ID 136798

September 09, 2015 12:54:06 PM

136798

Page 3

Item ID: D5155-7

Accept

N19000040100Setup Start ***NS1***

Revision ID:

Item Name: Co-Pilot Collective Head (205)

Stop ***NS2***

Start Date: 9/9/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 9/23/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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160

Identify as per dwg & Stock Location: up 001 0.00***160***

Packaging

Memo

0.00

Packaging

2 EL 15-9-24

170

QC21- Final Inspection - Work Order Release 0.00

170

QC

Memo

0.00

Quality Control

MCS SEP 24 201520150924
SH

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date :	Step #:	QTY Effective :		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : ☐					

Picklist Print

September 09, 2015 12:54:13 PM

Page 1

Work Order ID: 136798

136798

Parent Item: D5155-7

D5155-7

Parent Item Name: Co-Pilot Collective Head (205)

Start Date: 9/9/2015

Required Date: 9/23/2015

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV.A NEW ISSUE JFS 15/01/14 VERIFIED BY: JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
M6061T6B2.750X03.75 0		Purchased			No	100	f	9.0000	0.417	0.438947			

M6061T6B2 750X03 750

6061-T6 BAR 2.75 X 3.75

**

L.A. 15/09/21

Location

Loc Qty

Loc Code

MAT005

9

→ 114854

7

→ m127464

2

0.420 ft
0.8416 ft

1261⁶

136798
SM
20150909

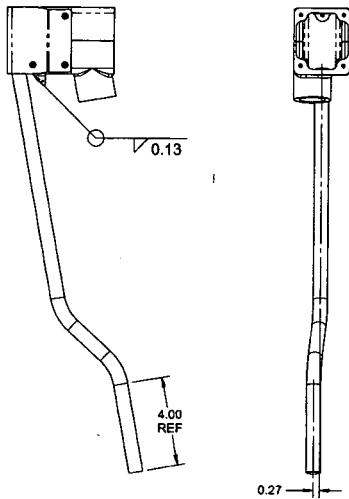
ITEM	QTY	P/N	DESCRIPTION
1	X	D5155-041	CO-PILOT COLLECTIVE HEAD ASSEMBLY (205)
2	1	D4410-7	CONDUIT
3	1	D5155-1	CO-PILOT COLLECTIVE HEAD (205)
4	1	D5155-9	CO-PILOT COLLECTIVE HEAD (205)
5	1	D5156-9	BACK PLATE
6	11	90296A108	HELI-COIL INSERT (6-32 X 0.276)
7	2	MS16562-223	SLOTTED SPRING PIN
8	7	MS24893-24B	SCREW, CSK 100"

D

C

B

A

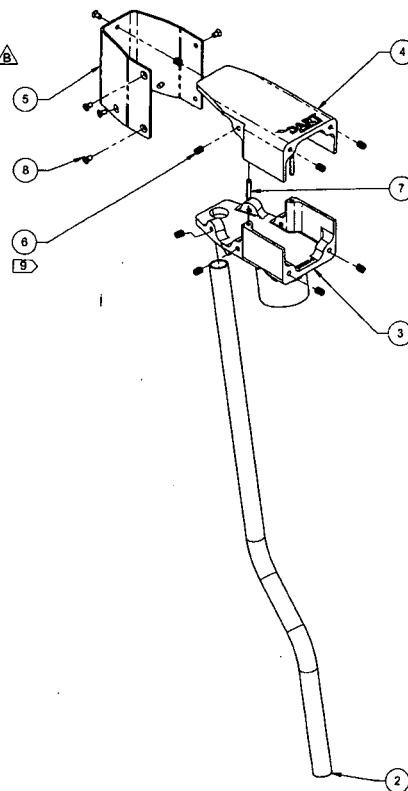


D5155-041 WELDING DETAIL

NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: ANODIZE BLACK PER MIL-A-8625F TYPE I OR IB OR IC OR II OR IIB CLASS 2 AFTER WELDING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
- 7) WEIGHT: 1.08 lbs
- 8) WELD PER DART QSI 004
- 9) INSTALL AFTER ANODIZING

D5155-041 CO-PILOT COLLECTIVE HEAD ASSEMBLY (205)



APPROVED

RELEASED

A.R. 2015 JUL 02 ECU 15-577

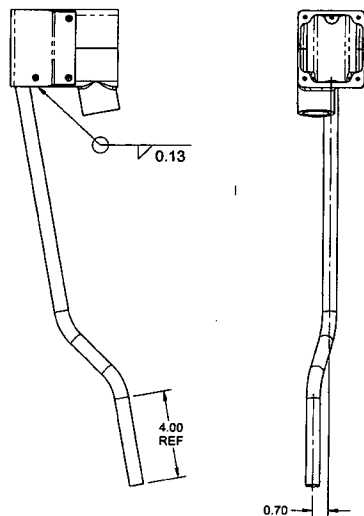
8	REVISE DIM. ZN D3-7, REVISE NOTE 2, ZN A8-13, A8-14, REVISE LENGTH OF PIN: ZN D6-1, D6-2, D5-3, D6-4, REVISE DEPTH: ZN C7-3, C7-7, C7-9, C7-11, C5-13, C4-14, REVISE DIM. ZN C7-5, C7-7, C7-8, C6-11, B7-13, B7-14, B2-5, B7-7, B2-8, B2-11, C2-13, C4-14, D4-6, D5-8, D3-10, D5-8, D5-10, D5-12, B6-7, D7-12, C7-5, C7-7, C7-9, C6-11, D2-13, D2-14	VS	15.05.21
A	NEW ISSUE	VS	14.09.10
REV.	DESCRIPTION	BY	DATE
DESIGN	VS		
DRAWN	VS		
CHECKED	RF		
MFG. APPR.	JFS		
APPROVED	HS		
DE APPR.	DS		
DATE	15.05.21		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. **D5155** REV. B
SHEET 1 OF 14
TITLE **CO-PILOT COLLECTIVE HEAD** SCALE NTS

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ITEM	QTY	P/N	DESCRIPTION
1	X	D5155-043	CO-PILOT COLLECTIVE HEAD ASSEMBLY (212)
2	1	D4410-7	CONDUIT
3	1	D5155-3	CO-PILOT COLLECTIVE HEAD (212)
4	1	D5155-11	CO-PILOT COLLECTIVE HEAD (212)
5	1	D5156-11	BACK PLATE
6	11	90286A108	HELL-COIL INSERT (6-32 X 0.276)
7	2	MS16562-223	SLOTTED SPRING PIN
8	7	MS24683-248	SCREW, CSK 100°

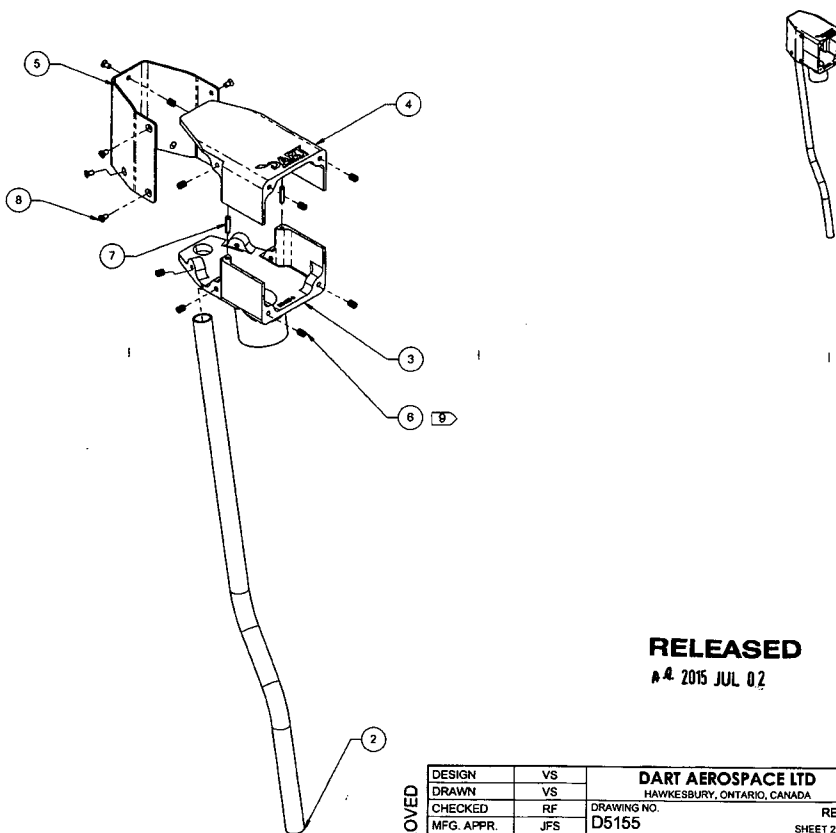


D5155-043 WELDING DETAIL

NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: ANODIZE BLACK PER MIL-A-8625F TYPE I OR IB OR IC OR II OR IIB CLASS 2 AFTER WELDING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
- 7) WEIGHT: 1.20 lbs
- 8) WELD PER DART QSI 004
- 9) INSTALL AFTER ANODIZING

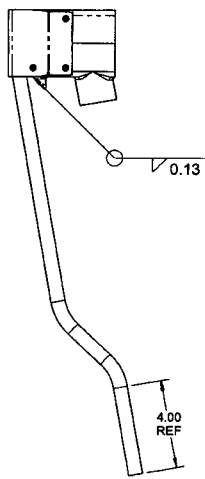
D5155-043 CO-PILOT COLLECTIVE HEAD ASSY (212)



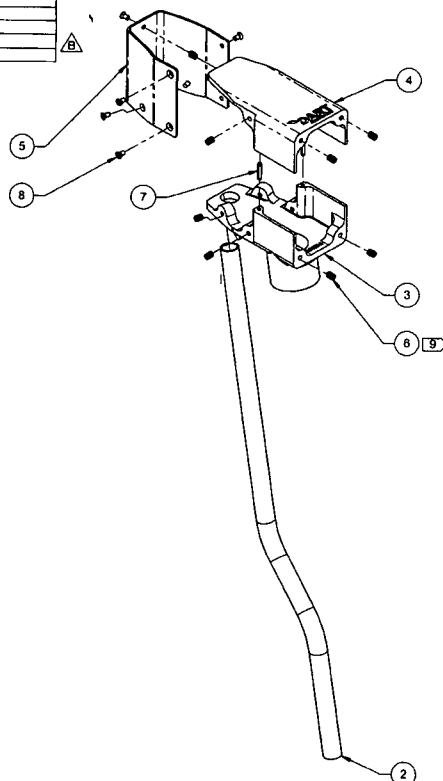
RELEASED
#4 2015 JUL 02

DESIGN	VS	DART AEROSPACE LTD	
DRAWN	VS	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	JFS	D5155	SHEET 2 OF 14
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
DATE	15.05.21	COPYRIGHT © 2013 BY DART AEROSPACE LTD	

ITEM	QTY	P/N	DESCRIPTION
1	X	D5155-045	CO-PILOT COLLECTIVE HEAD ASSEMBLY (EAGLE SINGLE)
2	1	D4410-7	CONDUIT
3	1	D5155-5	CO-PILOT COLLECTIVE HEAD (EAGLE SINGLE)
4	1	D5155-9	CO-PILOT COLLECTIVE HEAD (205)
5	1	D5155-9	BACK PLATE
6	11	90256A108	HELL-COIL INSERT (6-32 X 0.276)
7	2	MS16562-223	SLOTTED SPRING PIN
8	7	MS24893-248	SCREW, CSK 100"



D5155-045 WELDING DETAIL



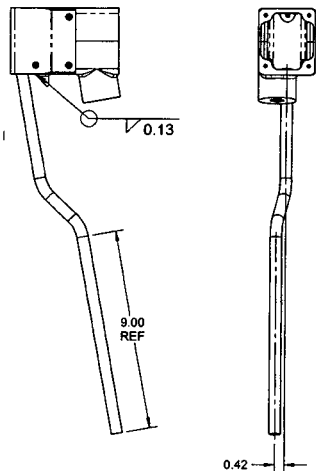
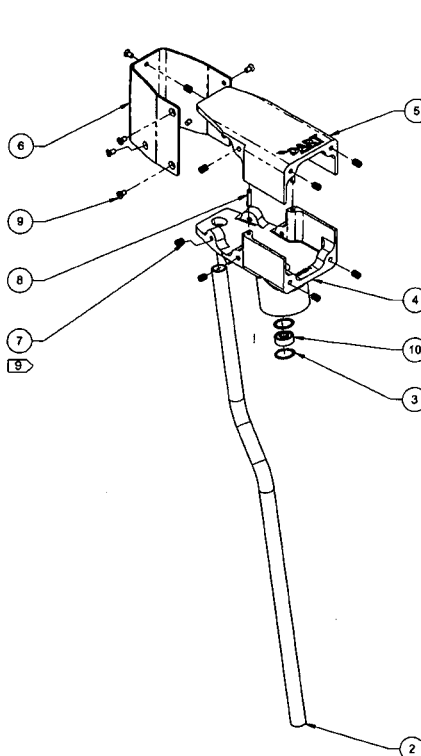
D5155-045 CO-PILOT COLLECTIVE HEAD ASSY (EAGLE SINGLE)

- NOTES:**
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 2) FINISH: ANODIZE BLACK PER MIL-A-8625F TYPE I OR IB OR IC OR II OR IB CLASS 2 AFTER WELDING
 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
 7) WEIGHT: 1.06 lbs
 8) WELD PER DART QSI 004
 9) INSTALL AFTER ANODIZING

DESIGN	VS	DART AEROSPACE LTD	
DRAWN	VS	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	JFS	D5155	SHEET 3 OF 14
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
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RELEASED
 A-E 2015 JUL 02

ITEM	QTY	P/N	DESCRIPTION
1	X	D5155-047	CO-PILOT COLLECTIVE HEAD ASSEMBLY
2	1	D5054-1	CONDUIT
3	2	D5073-1	SNAP RING
4	1	D5155-7	CO-PILOT COLLECTIVE HEAD (205)
5	1	D5155-9	CO-PILOT COLLECTIVE HEAD (205)
6	1	D5156-9	BACK PLATE
7	11	90296A108	HELI-COIL INSERT (6-32 X 0.276)
8	2	MS16562-223	SLOTTED SPRING PIN
9	7	MS24693-24B	SCREW, CSK 100
10	1	MS27641-3	BEARING



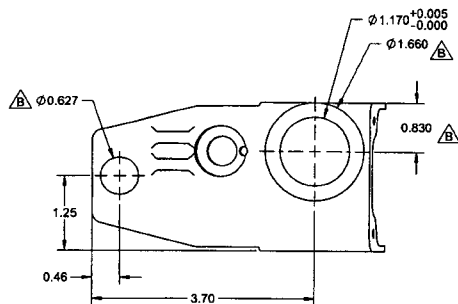
- NOTES:
- 1) MATERIAL: N/A
 - 2) FINISH: ANODIZE BLACK PER MIL-A-8625F TYPE I OR IB OR IC OR II OR IIB CLASS 2 AFTER WELDING
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.1
 - 7) WEIGHT: 1.14 lbs
 - 8) WELD PER DART QSI 004
 - 9) INSTALL AFTER ANODIZING

D5155-047 CO-PILOT COLLECTIVE HEAD ASSY
FOR 205 WITH 204-001-290-5 STICK AND THROTTLE ASSEMBLY INSTALLED

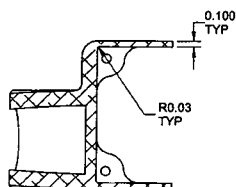
RELEASED
 a.e. 2015 JUL 02

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DRAWN	VS		
CHECKED	RF	DRAWING NO	REV. B
MFG. APPR.	JFS	D5155	SHEET 4 OF 14
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
DATE	15.05.21	COPYRIGHT © 2013 BY DART AEROSPACE LTD THIS DOCUMENT IS UNCLASSIFIED AND IS NOT TO BE RELEASED OR DISCLOSED TO ANY OTHER PERSON WITHOUT APPROPRIATE AUTHORITY FROM DART AEROSPACE LTD	

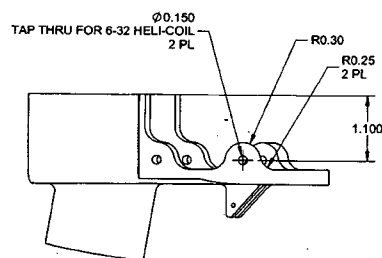
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	DRAWN	VS		SHEET 5 OF 14
	CHECKED	RF		SCALE
	MFG. APPR.	JFS		
	APPROVED	HS		
	DE APPR.	DS		
	DATE	15.05.21		



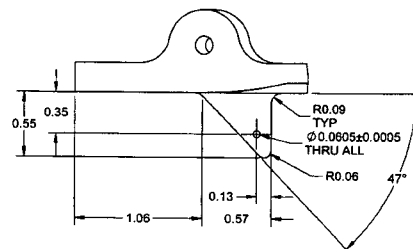
VIEW B-B
B5-6



SECTION D-D
D6-5



VIEW C-C
D7-5



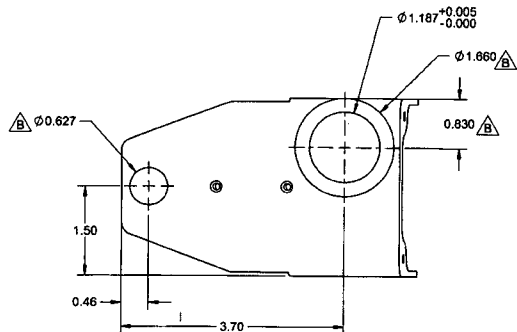
DETAIL E
B7-5

RELEASED
A.E. 2015 JUL 02

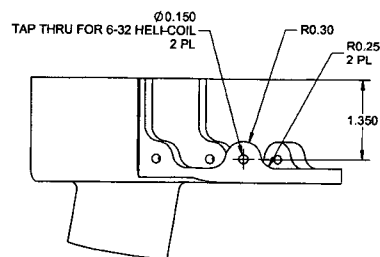
- NOTES:**
 1) MATERIAL: N/A
 2) FINISH: N/A
 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 6) IDENTIFICATION: N/A
 7) WEIGHT: N/A

D5155-1 CO-PILOT COLLECTIVE HEAD (205)
DETAIL VIEWS

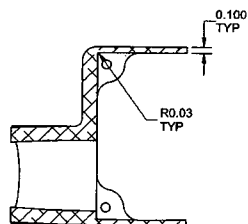
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DRAWN	VS	HAWKESSBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	JFS	D5155	SHEET 6 OF 14
APPROVED	HS	TITLE	SCALE
DE APPR.	DS-#	CO-PILOT COLLECTIVE HEAD	NTS
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VIEW G-G
B6-7



VIEW H-H
D7-7



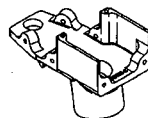
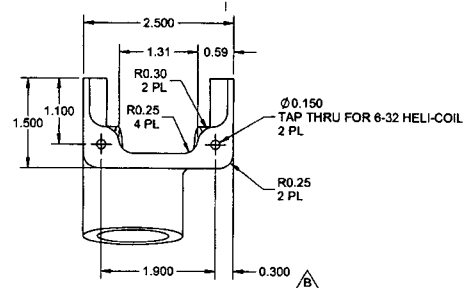
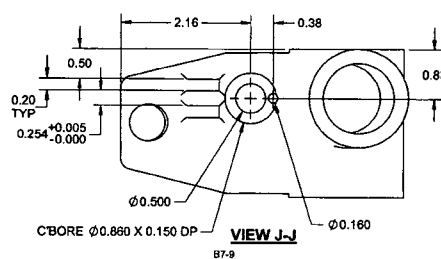
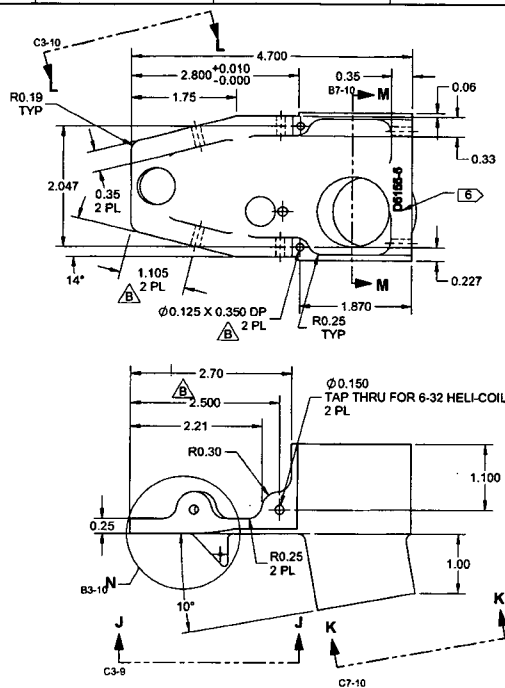
SECTION I-I
D8-7

RELEASED
A-0 2015 JUL 02

- NOTES:
1) MATERIAL: N/A
2) FINISH: N/A
3) TOLERANCES: PER DART OSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: N/A
7) WEIGHT: N/A

D5155-3 CO-PILOT COLLECTIVE HEAD (212)
DETAIL VIEWS

APPROVED	DESIGN	VS	DART AEROSPACE LTD	
	DRAWN	VS	HAWKESBURY, ONTARIO, CANADA	
	CHECKED	RF	DRAWING NO.	REV. B
	MFG. APPR.	JFS	D5155	SHEET 8 OF 14
	APPROVED	HS	TITLE	SCALE
	DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
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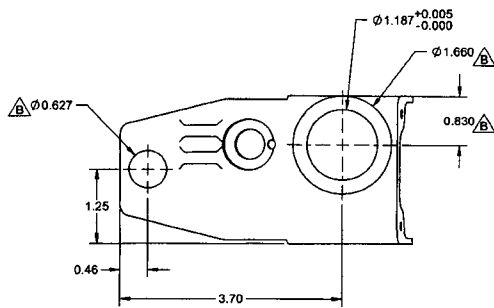


- NOTES:**
- 1) MATERIAL: 6061-T6/T651/T6511/T62 ALUMINUM BAR
PER QQ-A-225/8 OR AMS-QQ-A-225/8 (OR AMS 4117/4128/4115/4116)
OR QQ-A-200/8 OR AMS-QQ-A-200/8 (OR AMS 4160)
OR ASTM B211 OR ASTM B221
REF DART SPEC M6061T68
 - 2) FINISH: NONE
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.3 IN THIS AREA TO MAX DEPTH
OF 0.010 WITH A MIN. TOOL RAD OF R0.010
 - 7) WEIGHT: 0.45 lbs
 - 8) UNDIMENSIONED FEATURES DEFINED BY D5155-5.SLDPR

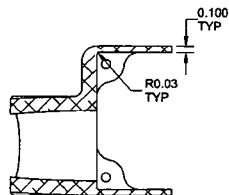
D5155-5 CO-PILOT COLLECTIVE HEAD (EAGLE SINGLE)

RELEASED
2015 JUL 02

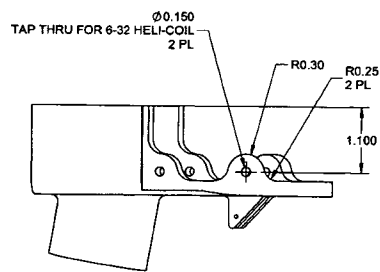
DESIGN	VS	DART AEROSPACE LTD	
DRAWN	VS	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	JFS	D5155	SHEET 9 OF 14
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
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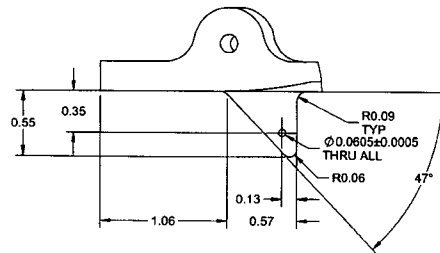
VIEW K-K
B6-9



SECTION M-M
D6-9



VIEW L-L
D7-9



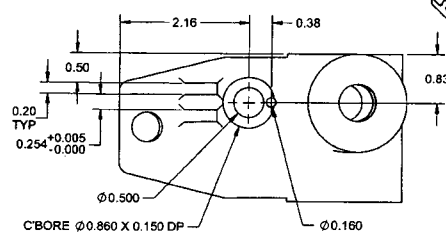
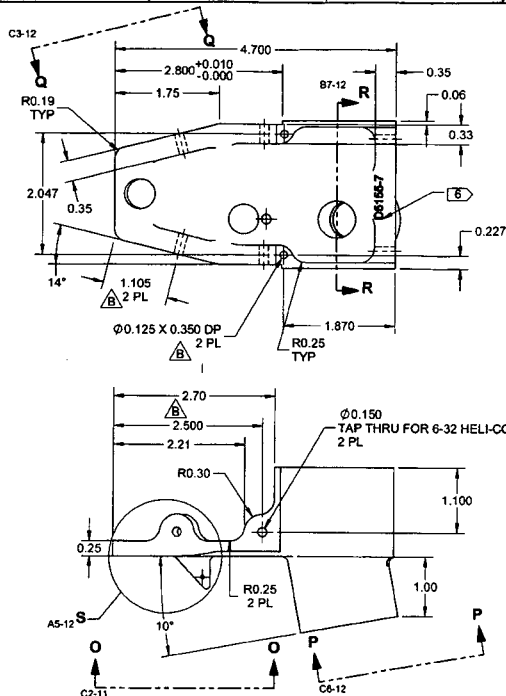
DETAIL N
B7-9

RELEASED
A.P. 2015 JUL 02

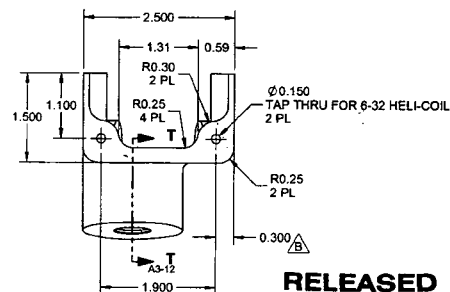
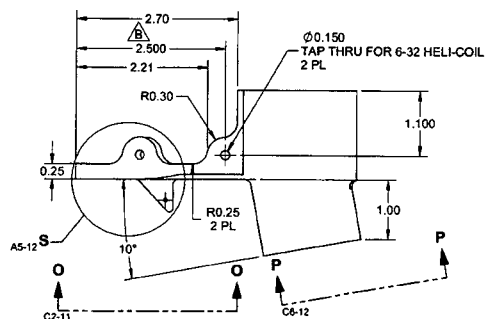
- NOTES:**
 1) MATERIAL: N/A
 2) FINISH: N/A
 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 6) IDENTIFICATION: N/A
 7) WEIGHT: N/A

D5155-5 CO-PILOT COLLECTIVE HEAD (EAGLE SINGLE)
DETAIL VIEWS

APPROVED	DESIGN	VS	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
	DRAWN	VS		
	CHECKED	RF	DRAWING NO.	REV. B
	MFG. APPR.	JFS	D5155	SHEET 10 OF 14
	APPROVED	HS	TITLE	SCALE
	DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
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VIEW O-O
B7-11

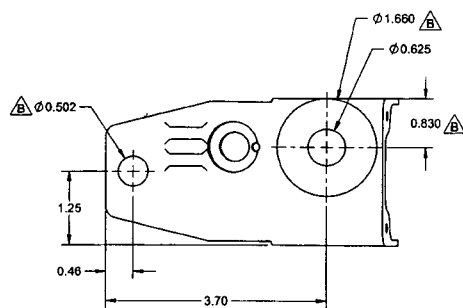


RELEASED
A.R. 2015 JUL 02

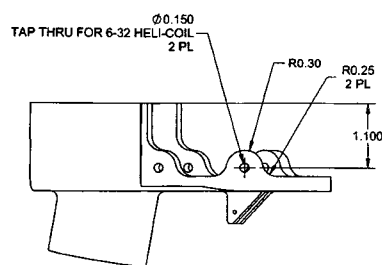
- NOTES:
- 1) MATERIAL: 6061-T6/T651/T6511/T62 ALUMINUM BAR
PER QQ-A-225/8 OR AMS-QQ-A-225/8 (OR AMS 4117/4128/4115/4116)
OR QQ-A-200/8 OR AMS-QQ-A-200/8 (OR AMS 4160)
OR ASTM B211 OR ASTM B221
REF DART SPEC M6061T6B
 - 2) FINISH: NONE
 - 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
 - 4) UNITS: INCHES UNLESS OTHERWISE NOTED
 - 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
 - 6) IDENTIFICATION: IDENTIFY PER QSI 044 6.3 IN THIS AREA TO MAX DEPTH
OF 0.010 WITH A MIN. TOOL RAD OF R0.010
 - 7) WEIGHT: 0.56 lbs
 - 8) UNDIMENSIONED FEATURES DEFINED BY D5155-7.SLDPRT

D5155-7 CO-PILOT COLLECTIVE HEAD (205)

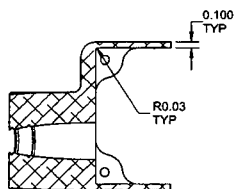
DESIGN	VS	DART AEROSPACE LTD	
DRAWN	VS	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	JFS	D5155	SHEET 11 OF 14
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
DATE	15.05.21	COPYRIGHT © 2012 BY DART AEROSPACE LTD	



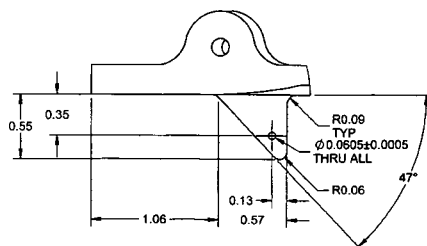
VIEW P-P
B5-11



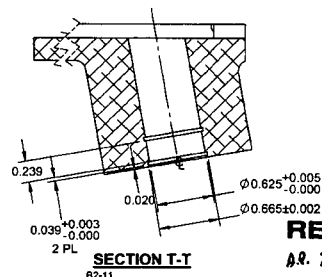
VIEW Q-Q
D7-11



SECTION R-R
C6-11



DETAIL S
B6-11



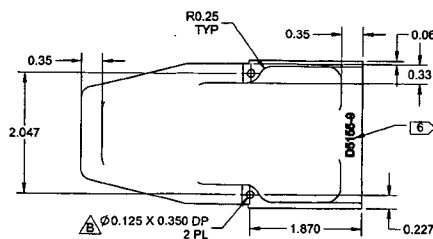
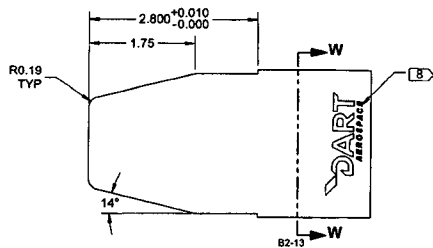
SECTION T-T
B2-11

RELEASED
A.R. 2015 JUL 02

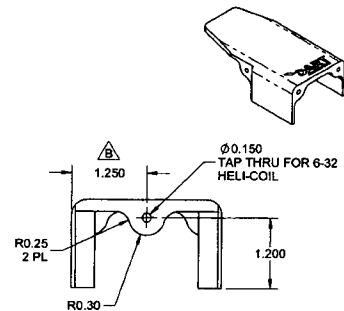
- NOTES:**
1) MATERIAL: N/A
2) FINISH: N/A
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: N/A
7) WEIGHT: N/A

D5155-7 CO-PILOT COLLECTIVE HEAD (205)
DETAIL VIEWS

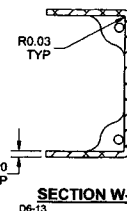
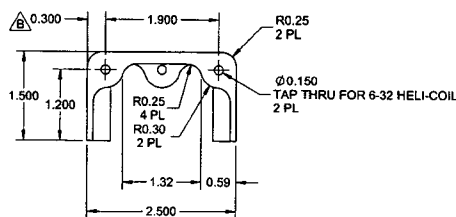
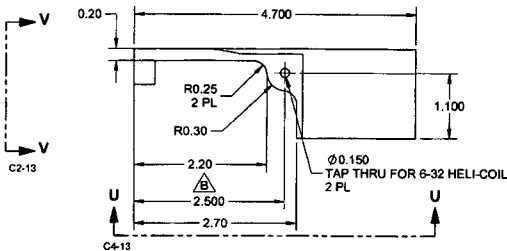
DESIGN	VS	DART AEROSPACE LTD	
DRAWN	VS	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. B
MFG. APPR.	JFS	D5155	SHEET 12 OF 14
APPROVED	HS	TITLE	SCALE
DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
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VIEW U-U
B7-13



VIEW V-V
B8-13



SECTION W-W
D6-13

RELEASED
4.8.2015 JUL 02

NOTES:
1) MATERIAL: 6061-T6/T651/T6511/T62 ALUMINUM BAR
PER QQ-A-225/8 OR AMS-QQ-A-225/8 (OR AMS 4117/4128/4115/4116)
OR QQ-A-200/8 OR AMS-QQ-A-200/8 (OR AMS 4160)
OR ASTM B211 OR ASTM B221
REF DART SPEC M6061T6B

2) FINISH: ANODIZE BLACK PER MIL-A-8625F TYPE I OR IB OR IC OR II
OR IIB CLASS 2

3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED

4) UNITS: INCHES UNLESS OTHERWISE NOTED

5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX

6) IDENTIFICATION: IDENTIFY PER QSI 044.6.3 IN THIS AREA TO MAX DEPTH
OF 0.010 WITH A MIN. TOOL RAD OF R0.010

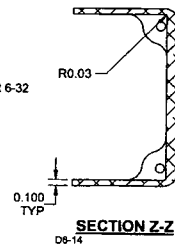
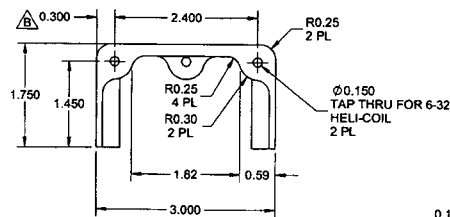
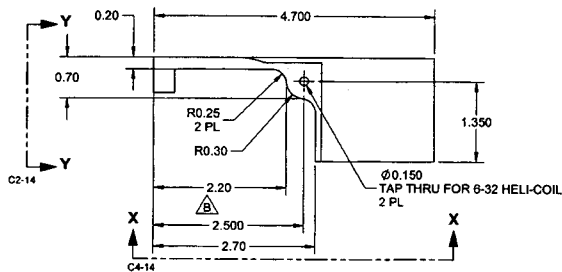
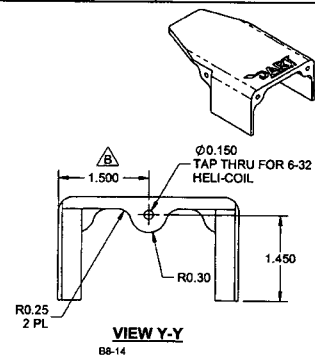
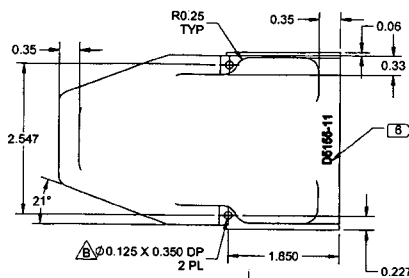
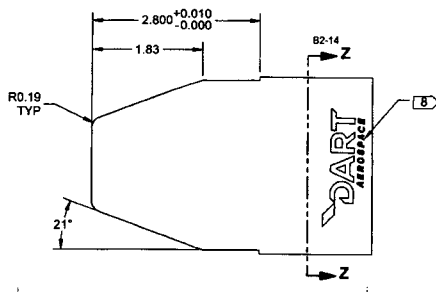
7) WEIGHT: 0.31 lbs

8) ENGRAVE "DART" LOGO AS SHOWN 0.003-0.005 DP

9) UNDIMENSIONED FEATURES DEFINED BY D5155-9.SLDPRT

D5155-9 CO-PILOT COLLECTIVE HEAD (205)

APPROVED	DESIGN	VS	DART AEROSPACE LTD	
	DRAWN	VS	HAWKESBURY, ONTARIO, CANADA	
	CHECKED	RF	DRAWING NO.	REV. B
	MFG. APPR.	JFS	D5155	SHEET 13 OF 14
	APPROVED	HS	TITLE	SCALE
	DE APPR.	DS	CO-PILOT COLLECTIVE HEAD	NTS
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NOTES:

1) MATERIAL: 6061-T6/7051/7051/7051 ALUMINUM BAR
PER QQ-A-225/8 OR AMS-QQ-A-225/8 (OR AMS 4117/4128/4115/4116)
OR QQ-A-200/8 OR AMS-QQ-A-200/8 (OR AMS 4160)
OR ASTM B211 OR ASTM B221
REF DART SPEC M505176B

2) FINISH: ANODIZE BLACK PER MIL-A-8625F TYPE I OR IB OR IC OR II
OR IIB CLASS 2

3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED

4) UNITS: INCHES UNLESS OTHERWISE NOTED

5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX

6) IDENTIFICATION: IDENTIFY PER QSI 044 6.3 IN THIS AREA TO MAX DEPTH
OF 0.010 WITH A MIN. TOOL RAD OF R0.010

7) WEIGHT: 0.36 lbs

8) ENGRAVE "DART" LOGO AS SHOWN 0.003-0.005 DP

9) UNDIMENSIONED FEATURES DEFINED BY D5155-11.SLDPRT

D5155-11 CO-PILOT COLLECTIVE HEAD (212)

RELEASED
A.R. 2015 JUL 02

DESIGN	VS	DART AEROSPACE LTD
DRAWN	VS	HAWKESBURY, ONTARIO, CANADA
CHECKED	RF	DRAWING NO. D5155
MFG. APPR.	JFS	REV. B
APPROVED	HS	SHEET 14 OF 14
DE APPR.	DS	TITLE CO-PILOT COLLECTIVE HEAD
DATE	15.05.21	SCALE NTS

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DART AEROSPACE LTD		Work Order:	136798
Description: <i>Capitol - collective Head</i>		Part Number:	D5155-7
Inspection Dwg: <i>D5155</i> Rev: <i>B</i>		Page 1 of 1	

INSPECTION SHEET

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
0.227	+/-0.010	0.227	✓		H-6	31006
0.33	+/-0.030	0.326	✓		Mic	GA-03
0.06	+/-0.030	0.063	✓		D-6	GA-08
0.35	+/-0.030	0.350	✓		Mic	GA-03
4.700	+/-0.010	4.697	✓		Vern	GA-13
2.800	+0.010 / -0.000	2.8005	✓		H-6	31006
R0.19	+/-0.030	R0.188	✓		R-6	ref.
2.047	+/-0.005	2.046	✓		H-6	31006
0.35	+/-0.030	0.350	✓		Vern	GA-13
14°	+/- 1/2°	14.1°	✓		Angle M	CNC-17
φ.125 x .350	+0.004 / -0.001 / +/-0.010	φ0.121 x 0.354	✓		Vern	GA-13
1.870	+/-0.010	1.870	✓		H-6	31006
φ0.150	+0.005 / -0.001	φ0.152	✓		Vern	GA-13
2.70	+/-0.030	2.698	✓		H-6	31006
2.500	+/-0.010	2.498	✓		"	"
R0.30	+/-0.030	R0.300	✓		R-6	ref.
0.25	+/-0.030	0.252	✓		Mic	118-120
10°	+/- 1/2°	10.1°	✓		Angle M	CNC-17
R0.25	+/-0.030	R0.250	✓		R-6	ref.
1.00	+/-0.030	1.000	✓		H-6	31006
1.100	+/-0.010	1.102	✓		"	"
0.83	+/-0.030	0.830	✓		"	"
0.38	+/-0.030	0.375	✓		"	"
2.16	+/-0.030	2.159	✓		"	"
0.50	+/-0.030	0.503	✓		"	"
0.20	+/-0.030	0.199	✓		Vern	GA-13
0.254	+0.005 / -0.000	0.2545	✓		"	"
φ0.500	+0.006 / -0.001	φ0.502	✓		"	"
φ0.860 x .150	+/-0.010 / +/-0.010	φ0.861 x .150	✓		"	"
φ0.160	+0.005 / -0.001	φ0.161	✓		"	"

Measured by: <i>D.A.</i>	DAS 08	Checked by: <i>14</i>	QC Inspector:
Date: <i>15/09/22</i>	9-89	Date: <i>15/09/23</i>	Date:

Engineering Approval: (If necessary)	Date:
--	--------------

Rev	Date	Change	Revised by	Approved
B	14.07.31	New Issue	KJ	

DART AEROSPACE LTD		Work Order:	136798
Description: Co-pilot collective head (205)		Part Number:	D5155-7
Inspection Dwg: D5155 Rev: B		Page 1 of 1	

INSPECTION SHEET

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
2.500	+/- .010	2.499	✓		Vern	GA-13
R0.30	+/- .030	R0.300	✓		R-6	ref.
R0.25	+/- .030	R0.250	✓		"	"
1.100	+/- .010	1.103	✓		H-6	31006
1.500	+/- .010	1.501	✓		Vern	GA-13
1.900	+/- .005	1.900	✓		"	"
0.300	+/- .010	0.301	✓		"	"
R0.25	+/- .030	R0.250	✓		R-6	ref.
φ 0.150	+ .005 / - .001	φ 0.151	✓		Vern	GA-13
0.830	+/- .010	0.830	✓		H-6	31006
φ 1.660	+/- .010	φ 1.660	✓		Mic	GA-02
1.25	+/- .030	1.250	✓		H-6	31006
φ 0.502	+ .008 / - .001	φ 0.504	✓		Vern	GA-13
1.25	+/- .030	1.250	✓		H-6	31006
0.46	+/- .030	0.460	✓		"	"
φ 0.150	+ .005 / - .001	φ 0.151	✓		Vern	GA-13
R0.30	+/- .030	R0.300	✓		R-6	ref.
R0.25	+/- .030	R0.250	✓		"	"
1.100	+/- .010	1.102	✓		H-6	31006
0.100	+/- .010	0.099	✓		Mic	GA-03
R0.030	+/- .030	R0.032	✓		R-6	ref.
0.55	+/- .030	0.549	✓		H-6	31006
0.35	+/- .030	0.349	✓		"	"
0.13	+/- .030	0.128	✓		"	"
R0.06	+/- .030	R0.063	✓		R-6	ref.
φ 0.0605	+/- .0005	φ 0.0605	✓		Mic / G-P	GA-03 / ref.
R0.09	+/- .030	R0.088	✓		R-6	ref.
0.239	+/- .010	0.237	✓		Inside M. / H-6	CNC-06 / 31006
0.039	+ .003 / - .000	0.041	✓		"	"
0.020	+/- .010	0.019	✓		"	"

Measured by: A.E.	DAS 08 9-89	Checked by: 14 9-89	QC Inspector:
Date: 15/09/22		Date: 15/09/23	Date:

Engineering Approval: (If necessary)	Date:
--	--------------

Rev	Date	Change	Revised by	Approved
B	14.07.31	New Issue	KJ	

